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Standard Solutions for Protection, Control and Information Systems

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STANDARD SOLUTIONS FOR PROTECTION, CONTROL AND INFORMATION SYSTEMS

1 SCOPE

- 1.1 This document defines a standardised approach for the provision of protection, control and information systems through the use of standard solutions and system architecture.
- 1.2 A list of definitions/terminology used in the document can be found in Appendix A.

2 POLICY REQUIREMENTS

Standard Solutions

- 2.1 To facilitate light current asset replacement and to achieve procurement and engineering economies, Standard Solutions for the provision of protection, control and information functions shall be developed.
- 2.2 NG shall be able to specify asset replacement requirements on the basis of predefined packages of functionality that suppliers can provide through the use of Type Registered Standard Solutions.
- 2.3 This policy document defines two package types, the Standard Bay Solution and Universal Modular Solution. The Standard Bay Solution contains a package of functions and interconnectivity appropriate to a specified type of substation plant bay, for example a feeder bay. A typical Standard Bay Solution function for a feeder bay would be distance protection. The Universal Modular Solution contains functions and interconnectivity that cannot or should not be closely integrated into the Standard Bay Solution. An example of a Universal Modular function would be busbar protection that is a station function and not a bay function.
- 2.4 Standard Bay and Universal Modular Solutions shall be engineered in a modular way to facilitate inter-changeability between suppliers, interfacing with legacy substation arrangements and asset replacement.
- 2.5 Standard Bay and Universal Modular Solutions shall use IED's for the implementation of the required protection, control and information functionality.
- 2.6 Acceptable IED function integration options are detailed in the appropriate bay level NGTS 3.24.xx series of technical specifications.

Standard Bay Solutions

- 2.7 A Standard Bay solution shall support the specified functions appropriate to a specific plant type (feeder, transformer bay etc.)
- 2.8 Functions not supported by a Standard Bay Solution shall be implemented as a Universal Modular Solution.
- 2.9 Standard Bay Solutions shall be engineered in a way that minimises the number of design variants required to cover the range plant and station configurations used by NG.
- 2.10 Appendix B, Table 2 through to Table 12, details for a range of bay types those functions that shall form part of the Standard Bay Solutions.

Universal Modular Solution

- 2.11 Where a function falls outside the scope of the Standard Bay Solution then these functions shall be implemented as a Universal Modular Solution.

- 2.12** A Universal Modular Solution will support a function or a group of functions such as substation control, busbar protection, LV ARS, ATCC, Operational Tripping etc. Station functions such as SAS, ATCC etc. may use as an option SBS IED's for data acquisition and plant control.
- 2.13** A Universal Modular Solution shall be capable of being installed as a standalone system. It shall be able to interface with legacy systems, Standard Bay Solutions and other Universal Modular Solutions.
- 2.14** Each Universal Modular Solution shall be engineered to minimise the number of design variants required to cover the range of plant and station configurations used by NG.

Application of Standard Solutions

Table 1 and Figure 1 illustrate the application of standard solutions to three sample asset replacement schemes and their associated interface with legacy systems.

Scheme 1: Install/replace the following function/assets at the specified sites	
Item	Standard Solution/Function
1	Standard Bay Solution for: 400kV Double Busbar Feeder

Scheme 2: Install/replace the following function/assets at the specified sites	
	Solution/Function Type
1	Universal Modular Solution for: 275kV Busbar Protection + Breaker Fail

Scheme 3: Install/replace the following function/asset at the specified sites	
	Solution/Function Type
1	Standard Bay Solution for: 400kV Double busbar feeder
2	Universal Modular Solution for: 400kV Busbar Protection + Breaker Fail
3	Universal Modular Solution for: Dynamic System Monitor
4	Universal Modular Solution for: SAS/Bay Control all bays

Table 1 - Example application of scheme build using Standard Bay Solutions and Universal Modular Solutions

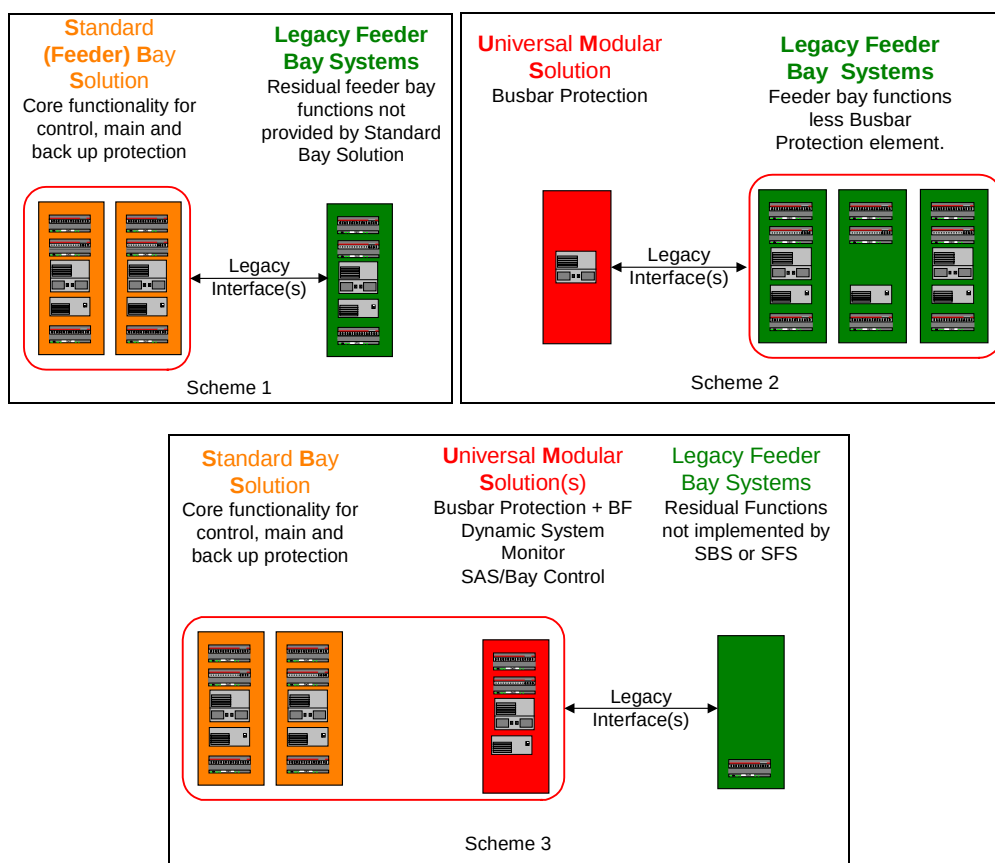


Figure 1 - Pictorial Representation of Schemes 1, 2 and 3 together with I/F to legacy systems

Substation Light Current Architecture

- 2.16 To facilitate development of Standard Solutions the substation light current architecture for all new substations and asset replacement schemes shall attempt to conform to the NG Substation Light Current Architecture detailed in Figure 2.

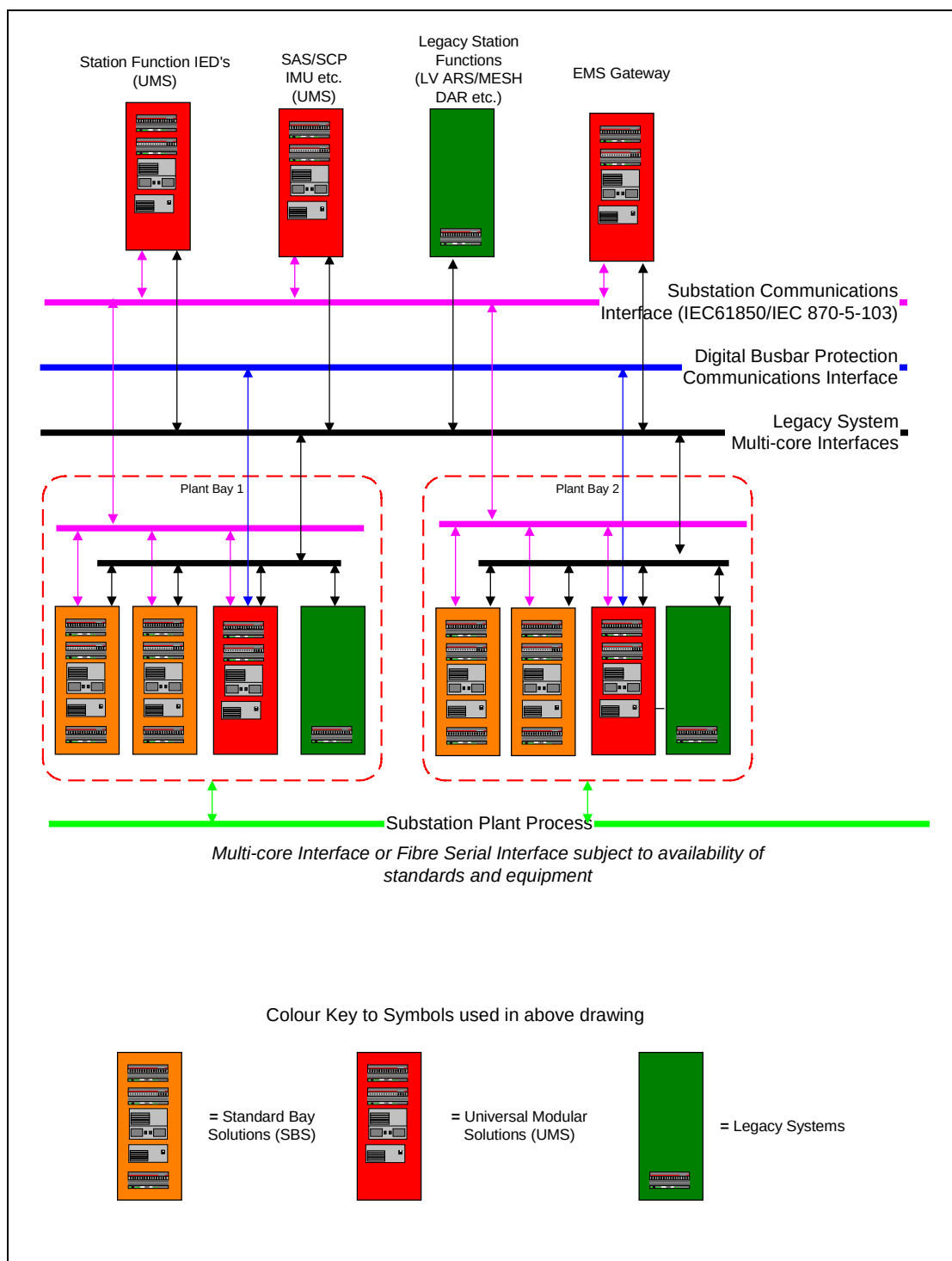


Figure 2: Light Current Equipment Reference Architecture

Substation and Bay Functionality

- 2.17 Functionality, interconnectivity and performance requirements of the functions within the Standard Bay Solutions and Universal Modular Solutions shall be defined in the relevant Function/Bay/Station level NGTS 3.24.xx technical specifications